REMARKS

Applicants have amended claim 1 by limiting the lithium compound to lithium sulfate. In this way, the limitations of claim 12 have been incorporated into claim 1 and the recitation of other lithium compounds has been eliminated. Accordingly, claims 11-12 have been cancelled. Following entry of these amendments, claims 1-3 and 6 are pending in the application.

Applicants appreciate the Examiner's participation in an interview on December 3, 2010 and agree with the Interview Summary mailed December 9, 2010.

Reconsideration of the present application is respectfully requested in view of the foregoing amendments and the remarks that follow.

Claim Objections

Claim 11 is objected to as a duplicate of claim 1. Claim 11 has been cancelled, rendering the objection moot.

Rejection Under 35 U.S.C. § 102

Claim 1, 6 and 11 were rejected as allegedly anticipated by either JP H07-245105 ("Nagayama") or U.S. Patent No. 5,427,875 ("Yamamoto"). For at least the following reasons, Applicants respectfully traverse this rejection.

Claim 1 recites a positive electrode material for non-aqueous electrolyte lithium ion battery, comprising an oxide containing lithium and nickel and a lithium compound deposited on a surface of the oxide. ***The specific lithium compound is lithium sulfate.***

Neither Nagayama nor Yamamoto teaches this combination of features. For example, neither Nagayama nor Yamamoto teaches that the lithium compound is lithium sulfate.

Claim 11 has been cancelled, rendering the rejection moot with respect to this claim. Claim 6 depends from amended claim 1, and is allowable for at least the same reasons as claim 1, without regard to the further patentable features contained therein. Favorable reconsideration of this rejection is respectfully requested.

Rejections Under 35 U.S.C. § 103

The currently-pending claims have been rejected under 35 U.S.C. §103 as follows:

(a) Claim 12 stands rejected as allegedly being unpatentable over Nagayama or Yamamoto in view of U.S. Patent Application Publication No. 2003/0157409 ("Huang"). Although this rejection appears third among the four rejections under Section 103, Applicants respectfully traverse this rejection and address it first, for reasons that will be apparent.

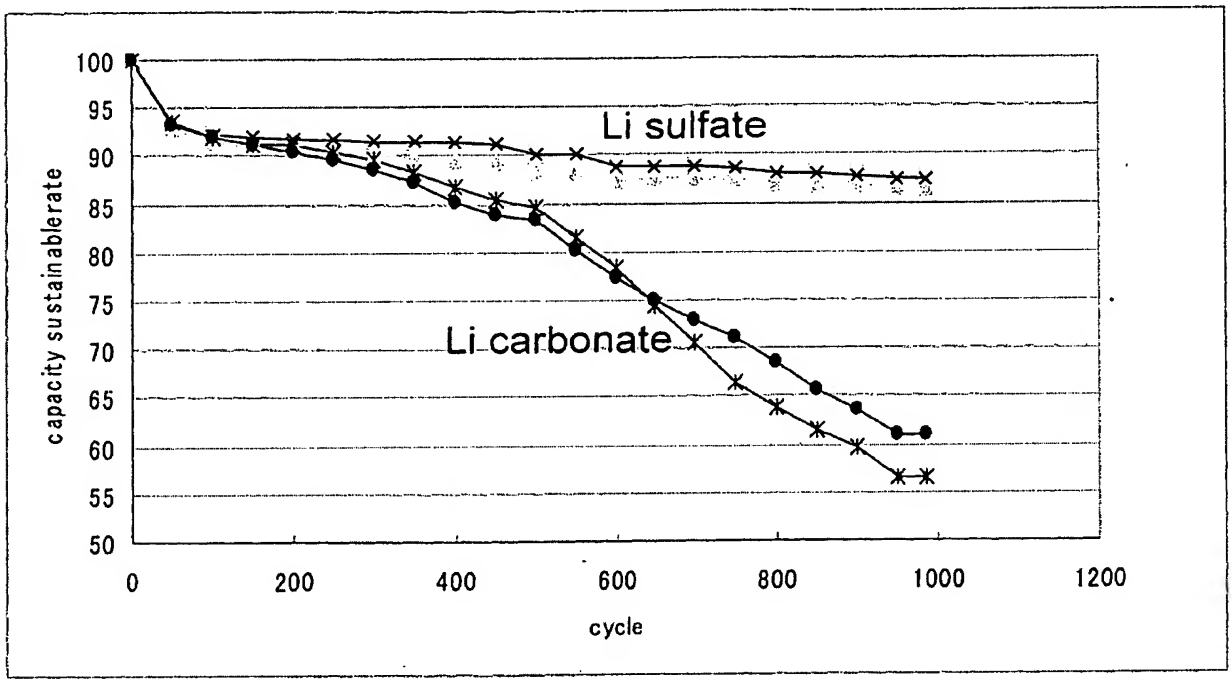
As discussed above, in an effort to expedite prosecution, claim 1 has been narrowed to additionally recite the limitations of original claim 12.

It is suggested that Nagayama and Yamamoto disclose an electrode material which is $LiNiO_2$ coated with $LiCoO_2$ and that Huang discloses a lithium secondary battery wherein the active material of the positive electrode element is selected from the group consisting of lithium intercalation compounds, lithium salts, lithium oxides, and combinations thereof, wherein the lithium intercalation compound is selected from the group consisting of $LiCoO_2$, $LiNiO_2$, $LiMn_2O_4$; the lithium salt is selected from the group consisting of LiF and Li_2SO_4; and the lithium oxide is selected from the group consisting of Li_2O and LiOH.

Along with this Response, Applicants have filed a Declaration of co-inventor Takamitsu Saito under 37 C.F.R. § 1.132. This Declaration sets forth additional data that shows the unexpected results of the use of lithium sulfate, i.e., the invention embodying amended claim 1, compared to lithium carbonate of the prior art. Specifically, the Declaration and the chart included therewith compare the "capacity sustainable rate" over 1000 cycles for an electrode coated with lithium sulfate and an electrode coated with lithium carbonate. Applicants submit that the "capacity sustainable rate" is an important parameter.

The Declaration and chart, reproduced below, show that an electrode material coated with lithium sulfate produces an excellent "capacity sustainable rate" over a larger number of cycles compared to the electrode material coated with lithium carbonate, i.e., the lithium sulfate causes much less degradation of the electrolyte over the extended cycle range. In other words, the use of lithium sulfate allows high capacity to be sustained over a larger number of cycles compared to lithium carbonate. As discussed in the specification, battery

capacity is an extremely important characteristic. The use of lithium sulfate allows a battery to maintain a high capacity because the electrolyte is not subject to much degradation.



The entirely unexpected results from this combination are shown in the above graph. Specifically, the graph shows that the battery with a lithium sulfate covering on the oxide of the positive electrode retained nearly 90% of its initial capacity after 1000 cycles. The battery with a lithium carbonate covering on the oxide of the positive electrode retained, on average, only 58% of its initial capacity after 1000 cycles. The superiority of lithium sulfate for this use was entirely unexpected.

Batteries using a lithium nickel oxide as the positive electrode material suffer from the problem that oxygen ions are oxidized by nickel ions with high valence within the positive electrode material into oxygen radicals and released to decompose the electrolyte solution in the battery. Lithium sulfate, when deposited onto the lithium nickel oxide, is drastically superior to lithium carbonate at preventing oxygen radicals from being emitted into the electrolyte solution. The results achieved by using lithium sulfate instead of lithium carbonate were entirely unexpected.

This unexpected and unpredicted improvement supports the argument that amended claim 1 is not obvious over the disclosure of Nagayama or Yamamoto in view of Huang. Applicants believe, and the Declaration states, that it would not have been obvious for one of ordinary skill in the art at the time of invention to simply substitute "lithium sulfate" for "lithium carbonate" to arrive at the invention embodying claim 1 and achieve the unexpected results of an increase in capacity sustainable rate.

Favorable reconsideration of the rejection is respectfully requested.

(b) Claim 2 is rejected as allegedly being unpatentable over Nagayama. Claim 2 is dependent on claim 1 and is patentable for at least the same reasons as claim 1, without regard to the further patentable features contained therein. Favorable reconsideration of the rejection is respectfully requested.

(c) Claim 3 is rejected as allegedly being unpatentable over Yamamoto. Claim 3 is dependent on claim 1 and is patentable for at least the same reasons as claim 1, without regard to the further patentable features contained therein. Favorable reconsideration of the rejection is respectfully requested.

(d) Claims 1, 2, 3, 6, 11 and 12 are rejected as allegedly being unpatentable over U.S. Patent No. 6,071,649 ("Mao") in view of Huang, as evidenced by Nagayama. For at least the following reasons, Applicants respectfully traverse this rejection.

It is suggested that Mao discloses a method of making an electrode material which is $LiNiO_2$ coated with a lithium compound. The combination of Mao in Huang, as evidenced by Nagayama, does not render amended claim 1 unpatentable for the same reasons discussed above with respect to Nagayama and Yamamoto—the use of lithium sulfate yields unexpected results, as discussed above.

Claims 11 and 12 have been cancelled, rendering the rejection moot with respect to these claims. Claims 2, 3, and 6 depend from claim 1 and are patentable for at least the same reasons as claim 1, without regard to the further patentable features contained therein. Favorable reconsideration of the rejection is respectfully requested.

Conclusion

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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ATTACHMENT